Exhibit 2 –

Expert Report

EXPERT REPORT OF ROBERT BIGGERSTAFF

Prepared in the matter of:

Robert Braver v. Northstar Alarm Servs, LLC

No. 5:17-cv-00383

Pending in the United States District Court for the Western District of Oklahoma

January 26, 2018

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Executive Summary

1. I was asked to examine documents provided by counsel and to develop and run queries against call records in order to identify telephone calls that delivered prerecorded messages to persons in a specific marketing list (leads).

2. I was also asked to analyze the records with respect to any indications that the values for callerID were manipulated so as to present false or deceptive information to the called party.

Retention and Scope of Work

3. Timothy Sostrin contacted me in regards to this matter on December 8, 2017 describing the materials containing call records and related documents that I subsequently received. Mr. Sostrin requested that I conduct analysis to identify records of calls that delivered prerecorded messages to persons in the Red Dot Data Marketing List.

Notice of Protective Order

4. Some materials I have examined and reported on in this case may be subject to the *Stipulated Protective Order* in this matter dated October 5, 2017.

Background and Qualifications

5. I obtained a Bachelors of Science in Engineering from Clemson University in 1987. I am retired from the position of Senior Support Systems Engineer, overseeing computer operations at a large production facility. I have continuously worked in the computer field for over 30 years, including work involving VLDB (Very Large DataBase) projects for the Department of Defense and large corporations. My particular expertise for most of this time has been data analysis and integration, design and implementation of large database projects, network design, forensics and data recovery, and network/computer security. This includes forensic examinations, intrusion detection, incident response, evidence preservation, integration and analysis of disparate data sources, and complex data recovery and analysis across a wide array of media, operating systems, and platforms from 1984 to present.

6. I am a certified computer forensic examiner and a member of the International Society of Forensic Computer Examiners ("ISFCE"). I have over 30 years of experience in forensic computer examinations and data recovery. I have been retained as a expert in computer forensics and data analysis in over 300 court cases and have performed hundreds of data recovery and ESI preservation assignments across many diverse platforms and filesystems.

7. I have direct experience in the role that computer records play in claims under the Telephone Consumer Protection Act ("TCPA"), specifically with regard to analyzing those records for the purposes of identifying persons to whom telephone calls were made, the circumstances of those calls, and for purposes of class certification and class notice.

8. As part of my work in data analysis, network and database design, and as a consultant, I have direct experience with many facets of telecom technology, including computer-based dialing and record-keeping systems, as well as technical specifications and details of call processing. This includes both evaluation and testing of many different systems, service and maintenance of such systems on a day to day basis, installation and configuration of such systems, as well as writing drivers and other software for telephony applications.

9. I have worked with records from many different communication service providers including phone companies and fax broadcasters, as well as reviewing testimony, forensic examinations of computers used in teleservices operations, user guides, and many other documents from those entities. In doing so, I have acquired an extensive base of knowledge regarding their records and business practices.

Materials Reviewed

10. In addition to any materials cited elsewhere herein, I reviewed the following material for the purpose of producing this report:

    a. northstar_outbound_lead_logs.csv (“calling records”).

    b. northstar_outbound_leads.csv (“lead records”).

    c. Transcript of the 30(b)(6) deposition of Kyle Wood with exhibits, dated December 20, 2017 (“Wood 30b6 depo.”)

d. Transcript of the 30(b)(1) deposition of Kyle Wood with exhibits, dated December 19, 2017 Volumes I and II ("Wood depo.")

11. I have also relied generally on orders, notices, and other promulgations of the Federal Communications Commission ("the Commission") regarding the agency's administration of the TCPA.

12. In preparing this report, I have also relied on knowledge and skills I acquired through my education, training, career, and experience.

Material Overview

13. The materials I reviewed, including testimony, indicate that the records I analyzed were from a dialing system that used technology commonly referred to an "avatar" where outbound telephone calls are made to consumers of a target language/country, and when answered, the calling party (agent) selects from various possible responses according to a script. The response is then delivered to the consumer by the agent playing one of many possible prerecorded messages, and then proceeding through a script, at each step playing a believed to be appropriate prerecorded message in response to the consumer. This allows, among other things, for agents with minimal skills in the target language or those with accents foreign to the target language, to make calls using recordings that utilize professional-grade voice talent. This avatar system used by Yodel that plays prerecorded messages is referred to by Mr. Wood as the "soundboard" system.

Analysis

Calling records

14. I analyzed the calling records ("northstar_outbound_lead_logs.csv") using MySQL and Microsoft Visual FoxPro, and found 77,912,856 total records. A table of the column names in this data is set out in Exhibit 1 hereto.

15. For records that had an "answer_time" and a "hangup_time" I was able to calculate the duration of the call in seconds.[1]

1. The "answer_time" and a "hangup_time" columns were recorded as 16-digit integers in epoch format which is the number of microseconds (millionths of a second) since the Unix "epoch"

Lead Records

16. I analyzed the lead records ("northstar_outbound_leads.csv") using MySQL and Microsoft Visual FoxPro and found 6,071,590 total leads. A table of the column names in this data is set out in Exhibit 2 hereto.

17. The call records and leads were connected by a primary key in the leads table of "id" represented in the column "outbound_lead_id" in the call records.[2]

18. Mr. Wood testified that in this file "are all leads that were ultimately called on behalf of Northstar" and that all calls Yodel made on behalf of Northstar were done through the Soundboard system.[3]

Identification of Records Responsive to Mr. Sostrin's Inquiry

19. To identify the call records responsive to Mr. Sostrin's inquiry, I selected the following criteria:

Values for "outbound_lead_group_id"

20. Mr. Wood testified that a value of "597" for outbound_lead_group_id identifies data "that came from Red Dot Data."[4] Data from Red Dot was described by Mr. Wood as only landline data, meaning it is just names and addresses of landline customers, and "[i]t's not consent data."[5]

21. To exclude any call records where consent may have existed, I elected to include only call records where the "outbound_lead_group_id" was 597 so as to include only leads from Red Dot Data.

Values for column "status_final"

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of January 1, 1970 (midnight UTC/GMT). MySQL natively supports epoch timestamps with 1-second resolution.

2. This was confirmed by Exhibit 60 to the Wood 30b6 depo.

3. Wood depo. (Vol I), at 32:6-15; 54:17-24.

4. *Id.*, at 28:24-29:8.

5. *Id.*, at 25:2-11.

22. The codes in the call records for columns "status_original" and "status_final" are documented by Mr. Wood.[6]

    a. A "status_final" value of 20 indicates a do-not-call request.[7]

    b. A "status_final" value of 50 indicates the call had progressed to the point that at least six prerecorded message prompts were played during the call.[8]

23. To identify calls meeting Mr. Sostrin's inquiry, I elected to select only call records with a "status_final" of 20 or 50.

Values for column "campaign_id"

24. Values for "campaign_id" are documented by Mr. Wood.[9] These indicate the name of the prerecorded "voice" used in the call.[10]

25. I found only four values for "campaign_id" in the call records: 70, 92, 105, and 106. The value of 92 is reported to be used for calls made for the purpose of training.[11] Therefore I elected to exclude records with "campaign_id" of 92.

Values for column "cc_agent "

26. Mr. Wood testified that "if [the cc_agent column is] populated, that means that a soundboard agent came onto the call after it was placed."[12] Therefore I elected to exclude records with no "cc_agent".

Values for column "hangup_cause"

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6. See Exhibit 56 to the Wood 30b6 depo., and accompanying text.

7. Wood 30b6 depo., at pp. 32-33.

8. Wood 30b6 depo., at pp. 34-35 (the "soundboard agent" "reached at least to [question] number 6" and "all of the prompts prior to that would have occurred").

9. *See* Exhibit 57 to the Wood 30b6 depo., at 36:19-37:12.

10. *Id.*

11. *See* Wood 30b6 depo., p. 35-37 and Exhibit 57 to that deposition.

12. Wood 30b6 depo, 70:12-15.

27. Values for "hangup_cause" are documented by Mr. Wood.[13] I am familiar with the table of codes included in Mr. Wood's deposition as standard call result descriptions set out as part of the ITU-T telecommunications standard Q.850. The call result "NORMAL_CLEARING" is used to denote a call result where one party simply hung up, as opposed to some error occurring preventing the call from reaching the destination or a network command to terminate the call.

28. Therefore I elected to select only records where the "hangup_cause" was "NORMAL_CLEARING".

Values for "ip_address" and "url"

29. Mr. Wood testified that the columns in the leads for "ip_address" and "url" were related to consent data.[14] Although I have seen no evidence that any person called actually consented to receive the calls, in order to eliminate any call records where consent may have existed, I elected to exclude any call records where the associated lead had a value in either the "ip_address" or "url".

Duration of call

30. I selected only records of calls longer than 30 seconds between answer and hangup, in order to eliminate records of calls that did not have ample time to proceed past a point where at least one prerecorded message was likely played.

Other Exclusions

31. To ensure that the call records I selected each connected directly to a lead record from Red Dot Data, I elected to exclude all call records where the"outbound_lead_id" column in the call records does not appear in the "id" column in the leads file as well as any call records where the matching lead records did not have a "outbound_lead_group_id" of 597.

Results

32. I found 252,765 call records matching the above criteria. Those calls were made to

13. *See* Exhibit 55 to the Wood 30b6 depo., at 22:12-20; Wood depo. (Vol I) at 62:15-20; 63:10-19.

14. Wood 30b6 depo., at 32:24-33:11.

239,630 unique leads based on the id column of the lead.

33. Mr. Sostrin requested a distribution of those results by "status code" which is:

status_code	Calls	Unique Leads
20	198,561	198,558
50	54,204	47,398

Records of calls to 405-360-7462

34. Mr. Sostrin requested that I identify any call records in these results of calls to the phone number 405-360-7462. I found one such record in these results which was a call dated "08/26/2016 11:17:16 AM" which was answered at "08/26/2016 11:17:32 AM" and hangup at "08/26/2016 11:28:21 AM" indicating a call length of 649 seconds. The outbound_lead_id for this call is "363702151".

35. In the leads table, I found only one record with id "363702151", which lists the first_name as "Robert" and the last_name as "Braver" with the phone_number of "405-360-7462".

CallerID Spoofing

36. Mr. Wood testified that the column "caller_id" contains "the phone number that's displayed to the person being called"[15] meaning the number that would show up on the called party's caller ID.

37. I found 75,443,785 call records with a value entered for caller_id. Of those, I found 37,887,171 unique phone numbers in the caller_id column. I found 31,582,163 (83.35%) of those unique numbers were used only once in the table of call records.

38. Of the 37,887,171 unique phone numbers in the caller_id column, 37,877,702 (99.975%) of them were invalid under North American Numbering Plan Administration ("NANPA")[16] dialing rules because they had an invalid exchange due to the first digit of the exchange being a "1".

15. Wood depo., (Vol II) at 83:9-10

16. *See* https://www.nationalnanpa.com.

39. Of the 75,443,785 call records with a value entered for caller_id, 75,073,628 (99.51%) of them had the same area code as the number being called.

40. Of the 252,765 call records matching the criteria I applied earlier in this report, 235,424 (93.4%) had a caller_id value that had been modified to match the area code of the number being called.

41. These data are consistent with a practice of falsifying ("spoofing") the callerID of a call to replicate the area code of the called party, to make it appear that the call is coming from a nearby caller. Federal Communications Chairman Ajit Pai described this practice as:

> Spoofing is essentially where an unscrupulous robocaller will mask the true phone number they are calling from. They'll use your area code, or maybe the first three digits of your phone number, to make it seem it's coming from somebody you might trust, a neighbor or someone from the neighborhood.[17]

42. It is highly unlikely that any entity is using 37 million different telephone numbers for direct-dial calls. Given the large number of different phone numbers found in the caller_id column, these data indicate that the caller_id values used for these calls were not phone numbers used by or assigned to the calling entity.

43. Given the large number of invalid numbers used for the caller_id, these data indicate that the caller_id values used for these calls were being manipulated to obfuscate the source of the calls.

44. Given the large number of invalid phone numbers used for the caller_id that also matched the area code of the called number, these data indicate that the caller_id values used for these calls were being manipulated in a way that falsely indicated the caller was geographically near to the called party by nature of being within the same area code.

Conclusions

45. The criteria I used to identify responsive records can easily be easily modified as

17. *Robo Rage: Spoofing scam hits DC region using local numbers*, https://wtop.com/local/2017/09/robo-rage-spoofing-scam/ (last visited Jan. 24, 2018).

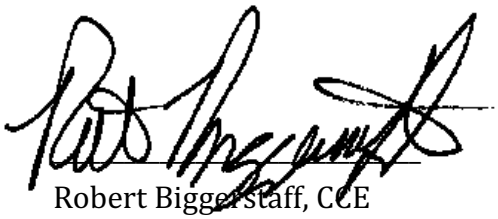
desired. In the event analysis is desired that uses different criteria than what I set out in this report, I am prepared to re-run this analysis with whatever criteria are desired.

46. The criteria I have applied to identify calls meeting Mr. Sostrin's inquiry, identify calls where prerecorded messages were delivered to the called party without express consent to a high degree of scientific certainty.

47. My analysis found 252,765 records of calls meeting criteria that, to a high degree of scientific certainty, identify calls where prerecorded messages were delivered to the called party without express consent.

48. My analysis found 75,073,628 records of calls where the CallerID was modified to display the same area code as the called party and 99.975% of those callerID values were invalid telephone numbers under the NANPA dialing rules. This manipulation was likely done to induce the called party to stop, answer the call and give their time and attention to the caller rather than ignore the call.

49. The facts, conclusions, and opinions stated herein are made to a reasonable degree of scientific certainly based upon examination of the information cited herein. The principles and methods I have used are reliable, repeatable, and generally accepted. To the extent any portion of this report is based on limited information or where further analysis, testimony, opinions, or information are provided, the contents of this report are subject to revision and supplementation.



Robert Biggerstaff, CCE

Cert. No. 1360

January 26, 2018

Rule 26(a)(2) Disclosures

Compensation

$18,000 flat fee plus $450/hr for travel, testimony, and prep.

Publications in the last 10 years

None.

Qualifications

See attached resume and additional qualifications and background in the report.

Expert testimony for previous 4 years

1. A Aventura v. Tankless Water, No. 2009 CA 023494 (Fla. Cir.)
2. Brodsky vs Kaiglar, No. 08 CH 44036 (Ill. Cir.)
3. Buja v. Novation, No. 15-CV-81002 (S.D. Fla)
4. Byer v. Kapraun, No. 11-CH-5322 (Ill. Cir.)
5. Cabinet Dimensions v. Dr. Kellner, No. 09-CH-15982 (Ill. Cir.)
6. Central Alarm v. BFS, No. 14-cv-14166 (E.D. Mich.)
7. Compressor Engineering v. Chicken Shack, No. 2:10-cv-10059 (E.D. Mich.)
8. Connelly v. Hilton Grand Vacations, No. 12-CV-00599 (S.D. Cal.)
9. Cook v. PRA, No. 16-cv-673 (M.D. Fla.)
10. CVS v. Mildon Bus Lines, No. 09-cv-01572 (W.D. Pa.)
11. Daisy, Inc. v. Pollo Operations, Inc., No. 14-cv-564 (M.D. Fla.)
12. Etter v. Allstate, No. 17-cv-00184 (N.D. Cal. Cal.)
13. Evanston v. Poolman of Wisconsin, No. 15-cv-422 (N.D. Ill.)
14. FBS v. All Plumbing, No. 2011 CA 9575 (D.C. Cir.)
15. Fellen v. RehabCare Group, Inc., No. 1:14-20039-CIV (S.D. Fla.)
16. Geisman v. Allscripts, No. 12-cv-03233 (N.D. Ill.)
17. Gorss Motels v. Otis Elevators, No. 16-cv-01781 (D. Conn.)
18. Gorss v. Brigadoon, No. 16-cv-00330 (N.D. Indiana)
19. Gorss v. Safemark, No. 6:16-cv-1638 (M.D. Fla.)
20. Green v. Dahn Yoga, No. 07 CH 29482 (Ill. Cir.)
21. Hageman v. AT&T Mobility, LLC, No. CV 13-50-DLC-RWA (D. Mont.)
22. Hicklin v. National Pen, No. 14-cv-02657 (M.D. Fla.)
23. Hunt v. 21st Mortgage Co., No. 12-CV-2697 (N.D. Ala.)
24. Kaner v. Schiffman, No. 10-CA-001569 (Fla. Cir.)

25. Lanteri v. CPA, No. 13-cv-01501 (S.D. Ind.)
26. Margulis v. Surrey Vacation Resorts, No. 14-cv-01131 (E.D. Mo.)
27. Medical & Chiro v eClinicalWorks, No. 15-cv-01023 (M.D. Fla.)
28. Mixon v. Taylorville Chiropractic, No. 09-L-509 (Ill. Cir.)
29. New United v. Brown, No. 09 CH 15984 (Ill. Cir.)
30. PHS v. Allscripts, No. 12-cv-03233 (N.D. Ill.)
31. PHS v. Alma Lasers, No. 12-cv-04978 (N.D. Ill.)
32. PHS v. Dr. Diabetic, No. 12-CV-22330 (S.D. Fla.)
33. PHS-v-Salix, No. 15-cv-00036 (N.D.N.C.)
34. Practice v. Groupe Cirque du Soleil America, Inc, No. 14-CV-02032 (N.D. Ill.)
35. Rhea Drugstore v. Smith & Nephew, No. 15-cv-02060 (W.D. Tenn.)
36. Shamblin v. OFA, No. 13-cv-2428 (M.D. Fla.)
37. True Health Chiropractic Inc. v. McKesson Corp., No. 13-cv-02219 (N.D. Cal.)
38. Warnick v. DISH Network, No. 12-cv-1952 (D. Colo.)
39. Wilder v. Microwize, No. 11 CV 4357 (Wis. Cir. Ct.)
40. Zimmer v Integrated Pain, No. 14-CV-01121 (E.D. Mo.)

Table of Exhibits

EXHIBIT 1

Columns in Call Records

1	id
2	outbound_lead_id
3	metrix_couchdb_id
4	status_original
5	status_final
6	dial_start
7	dial_end
8	created_at
9	updated_at
10	outbound_lead_group_id
11	campaign_id
12	cc_agent
13	dial_time
14	answer_time
15	bridge_time
16	hangup_time
17	sip_gateway
18	switch
19	channel_uuid
20	hangup_cause
21	attempts
22	phone_number
23	caller_id
24	sip_hangup_disposition
25	foreign_id
26	lead_created_at

EXHIBIT 2

Columns in Leads

1	id
2	status
3	foreign_id
4	first_name
5	last_name
6	phone_number
7	address1
8	address2
9	city
10	state
11	postal_code
12	date_of_birth
13	alt_phone
14	email
15	gmt
16	dst
17	called_count
18	metrix_couchdb_id
19	last_local_call_time
20	created_at
21	updated_at
22	outbound_lead_group_id
23	ip_address
24	url
25	gross_income
26	act_date
27	import_log_id
28	campaign_id
29	area_of_study
30	education_level
31	degree_sought
32	universal_lead_id
33	ims_student_id
34	metadata
35	excluded
36	last_constraint_check
37	constraints_matched
38	consecutive_failed_calls
39	paused_until
40	partition_suffix

Robert R. Biggerstaff

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Mt. Pleasant, SC 29465

EDUCATION

Clemson University, Clemson, South Carolina. BS degree in Chemical Engineering, August 1987. Concentrations in Computer Science and English. Member of the *American Institute of Chemical Engineers*.

PROFESSIONAL DEVELOPMENT

Guest Lecturer, *Information Systems and Society*, Information Systems Management Program, Trident Technical College, Charleston, SC.

TECHNICAL

Well versed in a wide range of popular commercial software packages and operating systems; Intel based servers, Sun SPARCstations, IBM AS/400, and other RISC hardware, and most accessories, networks, and related standards. Expert in database design, optimization, and programming. Many years of experience in advanced RDBMS development. Extensive experience in many multiuser/multitasking network operating systems and environments including Novell, major Linux/Unix variants, AIX, and Windows NT. Expert skills in design, installation, management, optimization, and troubleshooting of routed and switched multiprotocol WAN/LAN environments utilizing TCP/IP, IPX, SNA, and other protocols. Experienced with sniffers, protocol analyzers, packed level analysis, and other wireline management tools. Also experienced with PLC/DCS systems including Allen-Bradley and Fisher PROVOX, as well as other process control and laboratory instrumentation systems. Fluent in 16 programming languages including Perl, SQL, 'C', HTML, Java, Javascript, FoxPro, Fortran, PL-1, and Assembler.

EXPERIENCE

April 1992 to Dec. 2003 (retired)

Westvaco Corporation, Charleston, SC. *Support Systems Engineer*

Duties include: Corporate level standards development, support, troubleshooting, and design of a multiprotocol production WAN/LAN infrastructure spanning 20 states with 70+ servers and 4000+ nodes utilizing TCP/IP, IPX, SNA, NetBIOS, and other protocols. Facilities and network security management. End user support. Knowledgebase development and training of other administrators and support staff. Intranet content, policy, and infrastructure development. Cooperative policy development and implementation for facilities management, security, resource usage, data management, access control, performance monitoring, and other issues. Provide a critical technical advisory role and technology assessment to management for planning and decision making. Development of custom applications for RDBM, process control interfaces, mainframe data interfaces, process data manipulation, ISO 9002 certification requirements, environmental and other regulatory compliance. Custom SAP interfaces. Webmaster.

April 1988 to April 1992

Computer Support, Greenville, SC / Charleston, SC. *Contract Analyst and Consultant*

Providing a wide range of technical services to clients on both short and long term assignments and projects. A partial list of services provided:

- System design, development, and installation. Network design and installation.
- Needs analysis and feasibility studies.
- Security Analysis

- Teaching, training, and instruction in hardware and commercial software packages.
- Custom programming of RDBMS for case management, inventory control, order entry/processing, process control, point-of-sale, payroll, graphics, and other applications.

Significant projects included:

- Development of custom SQL-based RDBMS for base housing maintenance at Fort Bragg utilizing AIX and UNIX with TCP/IP networking for PS/2 to AS/400 data interchange.
- Development team of an advanced minefield evaluation system for US Navy (COMMINEWARCOM) utilizing embedded SQL/C (Informix) and X-windows GUI.
- Development of onboard computer systems interface for Kodak Auxiliary Services interfacing ship's mainframe data systems to photo concessionaire's systems. Development of user interface and extensive application for process and control systems.
- Development of advanced formulary information management system including production capacity scheduling, performance monitoring, and sophisticated information management.

January 1986 to April 1988

North American Garment Finishers Inc. (NAGFI), Greenville, SC.*Director of Computer Operations*

Reporting directly to Sr. VP of Operations. Responsible for all computer systems, network design and operation, hardware installation and maintenance, and applications development. Major projects included developing production scheduling and capacity planning computer models, inventory control for JIT fulfillment, and database development for proprietary formularies. Training, supervision, and management of DP staff.

Security clearances and references available upon request